

What is claimed is :

1. A content-based multimedia retrieval system, comprising :

5 a first color quantization means for extracting a color histogram of query multimedia data ;

a second color quantization means for extracting color histograms of multimedia data to be retrieved ; and

10 a histogram conversion means for converting the color histogram of the extracted query multimedia data and the color histogram of the multimedia data to be retrieved so as to be same each other.

2. The content-based multimedia retrieval system according to claim 1, wherein the multimedia data are image data or video data.

15 3. The content-based multimedia retrieval system according to claim 1, wherein the color histograms are constructed on the basis of color spaces and color quantization methods.

20 4. The content-based multimedia retrieval system according to claim 1, wherein the content-based multimedia retrieval system further comprises a description means for describing color space and color quantization information, which are the bases of the color histograms, wherein the description means comprises :

25 a color space description means for describing color space constructing

the color histogram ; and

a quantization description means for describing color quantization method constructing the color histogram.

5            5.        The content-based multimedia retrieval system according to claim 1, wherein the histogram conversion means converts the color histogram of the query multimedia data so as to be corresponding to color space and color quantization method of the multimedia data to be retrieved.

10           6.        A content-based multimedia retrieval method, comprising :  
inputting query multimedia data ;  
converting the color histogram of the inputted query multimedia data and the color histogram of the multimedia data to be retrieved so as to be same each other ; and

15           calculating a similarity between the query multimedia data and multimedia data to be retrieved on the basis of the converted color histogram and outputting a retrieval result in accordance with the calculated similarity.

20           7.        The content-based multimedia retrieval method according to claim 6, wherein the multimedia data is image data or video data.

8.        The content-based multimedia retrieval method according to claim 6, wherein the color histograms are constructed on the basis of color spaces and color quantization methods.

9. The content-based multimedia retrieval method according to claim 6, wherein the converting process for converting into the same histogram comprises :

judging whether the color histogram of the query multimedia data is  
5 extracted before ;

reading a color histogram value extracted before and identifying based color space and color quantization method ;

reading a color histogram value of the multimedia data to be retrieved and identifying based color space and color quantization method ; and

10 converting the color histograms into the color histograms of the same color space and color quantization method when the color histogram of the query multimedia data and the color histogram of the multimedia data to be retrieved are not same in comparing.

15 10. The content-based multimedia retrieval method according to claim 9, wherein the content-based multimedia retrieval method further comprises extracting a color histogram of the inputted query multimedia data when the color histogram of the query multimedia data is not extracted before.

20 11. The content-based multimedia retrieval method according to claim 6, wherein the process for converting into the same histogram is performed by referencing the color space description information and quantization description information of the multimedia data to be retrieved and query multimedia data.

25 12. The content-based multimedia retrieval method according to claim

6, wherein the process for outputting the retrieval result comprises:

comparing the calculated similarity with a certain threshold value; and

outputting multimedia data corresponding to the color histogram of the multimedia data to be retrieved as a similar multimedia data when the similarity is

larger than the certain threshold value.

13. A content-based multimedia retrieval method for retrieving multimedia data by comparing query multimedia data with multimedia data to be retrieved, comprising :

extracting a color histogram of the query multimedia data ;

extracting a color histogram of the multimedia data to be retrieved ;

comparing the extracted color space and color quantization method of the query image with the color space and color quantization method of the multimedia data to be retrieved ; and

converting the color histogram of the extracted query multimedia data or the multimedia data to be retrieved into the same color histogram so as to have same color space and color quantization method each other when the color spaces and color quantization methods of the extracted multimedia data and multimedia data to be retrieved are different each other, and performing a retrieval in accordance with the similarity between the query multimedia data and multimedia data to be retrieved.

14. The content-based multimedia retrieval method according to claim 13, wherein the content-based multimedia retrieval method further comprises a step of performing a retrieval in accordance with the similarity between the

extracted query multimedia data and multimedia data to be retrieved when the color space and color quantization method of the extracted query multimedia data are same as the color space and color quantization method of the multimedia data to be retrieved.

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15. The content-based multimedia retrieval method according to claim 13, wherein the converting process for converting the color histogram converts the color space and color quantization method of the query multimedia data so as to correspond to the color space and color quantization method of the multimedia data to be retrieved.

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16. The content-based multimedia retrieval method according to claim 13, wherein the process for converting the color histogram converts the color space and color quantization method of the multimedia data to be retrieved so as to correspond to the color space and color quantization method of the query multimedia data.

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17. A content-based multimedia retrieval method, comprising :  
comparing the color spaces and color quantization methods of the query multimedia data and multimedia data to be retrieved ;

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converting the color histogram of the query multimedia data or color histogram of the multimedia data to be retrieved when the color space and color quantization method of the query multimedia data and the color space and color quantization method of the multimedia to be retrieved are different ; and

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calculating a similarity between the converted or unconverted query

multimedia data and multimedia data to be retrieved, and performing a retrieval in accordance with the calculated similarity.

18. The content-based multimedia retrieval method according to claim 5 17, wherein the color histogram converting process converts the color histogram of query multimedia data so as to correspond to the color space and color quantization method of the multimedia data to be retrieved.

19. A multimedia data generation method in retrieval of the multimedia 10 data using a color histogram of the multimedia data as a feature element for a content-based multimedia data retrieval, comprising :

generating color space description information describing what color space the color histogram of the multimedia data is constructed; and

generating quantization description information describing what color 15 quantization method the color histogram of the multimedia data is constructed.

20. The multimedia data information generation method according to claim 19, wherein the quantization description information describes a quantization level for each component of the color space, and a quantization method for each 20 component, wherein the quantization method is described uniformly or non-uniformly.

21. A histogram conversion method of multimedia data in retrieval of the multimedia data using a color histogram of the multimedia data as a feature 25 element for a content-based multimedia data retrieval, comprising :

projecting each subordinate color space of the color space of the quantized query multimedia data on the color space of the multimedia data to be retrieved ; and

distributing a bin value to each quantum of the color space of the multimedia data to be retrieved, which is overlapped with the projected color spaces.

22. The histogram conversion method according to claim 21, wherein the bin value is distributed in proportion to volume projected and overlapped to each quantum of the color space of the multimedia data to be retrieved.

23. The histogram conversion method according to claim 21, wherein the bin value distributing process comprises:

extracting a certain number of sampling points in the color space of the query multimedia data; and

approximating the extracted sampling point with a ratio distributed to each subordinate space of the projected multimedia data to be retrieved,

wherein the number of the sampling point is determined in accordance with the importance of the quantized subordinate space of the color space of the query multimedia data.

24. The histogram conversion method according to claim 23, wherein the importance is determined by considering a volumetric value of the quantized subordinate space of the color space of the query multimedia data or a bin value of the color histogram of the query multimedia data.

25. The histogram conversion method according to claim 23, wherein the importance is determined by considering both a volumetric value of the quantized subordinate space of the color space of the query multimedia data and a bin value of the color histogram of the query multimedia data.

26. The histogram conversion method according to claim 25, wherein the importance is determined by using a threshold value which is set as a value not sampling the bin value '0' or a value sampling the bin value excluding '0' with a maximum number.

27. The histogram conversion method according to claim 26, wherein the histogram conversion method adjusts deflection degree of a volumetric value of the quantized subordinate space of the color histogram of the query multimedia data about the bin value excluding '0'.

28. A content-based multimedia retrieval system, comprising :  
a first color quantization means for extracting color histogram of the multimedia data to be retrieved ;

a description means for describing color space and color quantization method of the extracted color histogram ; and

a second color quantization means for extracting color histogram of a query multimedia data with a method same as the described color space and color quantization method in order to perform the multimedia data retrieval.



29. The content-based multimedia retrieval system according to claim 28, wherein the content-based multimedia retrieval system further comprises a retrieval unit for calculating a similarity between the color histogram of the query multimedia data extracted before and the color histogram of the multimedia data to be retrieved, and outputting multimedia data in accordance with the calculated similarity as a retrieval result.

30. The content-based multimedia retrieval system according to claim 29, wherein the content-based multimedia retrieval system further comprises a database for storing the color histogram of the extracted query multimedia data.

31. The content-based multimedia retrieval system according to claim 29, wherein the description means comprises :

a color space description means for describing color space information which is the basis of the color histogram of the extracted multimedia data to be retrieved ; and

a quantization description means for describing color quantization information which is the basis of the color histogram of the extracted multimedia data to be retrieved.

32. A content-based multimedia retrieval method, comprising :

judging whether the color histogram of the query multimedia data corresponding to the color space and quantization method of the multimedia data to be retrieved is stored before ; and

calculating a similarity between the color histogram of the stored query

multimedia data and the color histogram of the multimedia data to be retrieved and performing a multimedia retrieval in accordance with the calculated similarity.

33. The content-based multimedia retrieval method according to claim

32, wherein the content-based multimedia retrieval method further comprises :

quantizing and extracting the query multimedia data with the color space and color quantization method of the multimedia data to be retrieved when the color histogram of the query multimedia data is not stored before;

storing the color histogram of the quantized and extracted query multimedia data; and

calculating a similarity between the color histogram of the extracted query multimedia data and the color histogram of the multimedia data to be retrieved and performing a multimedia retrieval in accordance with the calculated similarity.